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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/554,317

10/24/2005

Masatoshi Iio

040356-0574

4554

22428 7590 05/11/2009
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EXAMINER

CHUO, TONY SHENG HSIANG

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

05/11/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/554,317	Applicant(s) IIO, MASATOSHI	
	Examiner Tony Chuo	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-49 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 25-49 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/24/05</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 10/24/05 was filed on 10/24/05. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

3. The drawings filed on 10/24/05 are accepted by the examiner.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 25-49 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to

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which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The scope/breadth of the claimed subject matter includes a control method of "calculating a first energy loss caused by an increase in a non-hydrogen component in the anode gas while the purge valve is closed" and "calculating a second energy loss which corresponds to an amount of hydrogen lost from the anode gas when the purge valve is opened".

The nature of the claimed invention involves a method of removing impurity gases within the anode gas that is supplied to a fuel cell stack to enable an improvement in the power generating efficiency of a fuel cell system by setting the timing of such an impurity gas removal operation appropriately.

One skilled in the art at the time of the application would have known a method of removing impurity gases by purging the gas in the anode recirculation passage in accordance with a decrease in hydrogen concentration of the anode gas, an increase in the impurity gases concentration of the anode gas, or a decrease in the output of the fuel cell system.

The relative skill in the art would have included using sensors to determine the hydrogen gas concentration, impurity gases concentration, temperature, and pressure of the anode gas.

The information present in the current application, as originally filed, does not teach exactly how to make and use the claimed invention. The specification describes calculating a first energy loss by determining the variation ΔE_{DH2n} in the generated

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energy $EDH2n$ of the fuel cell stack 1 caused by a reduction in the hydrogen partial pressure $PH2n$. The controller refers to a map having the characteristic shown in Figure 6, which defines the relationship between hydrogen partial pressure $PH2n$ and the generated energy $EDH2n$, to determine $\Delta EDH2n$ from the hydrogen partial pressure $PH2n$ calculated during execution of the current routine and a hydrogen partial pressure $PH2n_{-1}$ calculated during execution of the previous routine. However, there is no explanation on how this map of $EDH2n$ vs. $PH2n$ is determined, nor are there any units for the generated energy $EDH2n$ or hydrogen partial pressure $PH2n$. Specifically, there is no explanation on what variables are measured, what mathematical formula or equation is used to calculate the generated energy $EDH2n$, the fuel cell operating conditions that were used to generate the map, or the hydrogen partial pressure $PH2n$ shown in Figure 6. Similarly, the specification also describes calculating a second energy loss by using a map having the characteristics shown in Figure 7 which defines the relationship between a variation in the hydrogen energy $EDPn$ that is lost through purging, $\Delta EDPn$, and purging interval, t_n . Therefore, one skilled in the art would not be enabled to calculate the first energy loss and the second energy loss without additional guidance on how to determine the maps shown in Figures 6 and 7.

Finally, one skilled in the art would not be able to make and use the claimed invention without undue experimentation. Without knowing the specifics on how to generate the maps shown in Figures 6 and 7, one skilled in the art would require a considerable amount of experimentation that is not routine in the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

/Jonathan Crepeau/
Primary Examiner, Art Unit 1795